

ASSET CREATION DEVELOPER PROCESS

INSTRUCTIONS AND TECHNICAL REQUIREMENTS FOR DRILLERS

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GLOSSARY OF TERMS

TERM	DEFINITION
Application – Water Main Connection Approval – Large (>DN 25)	Lodgement of an application for Sydney Water to approve a large water service connection to a water main. Approval from Sydney Water must be received prior to applying for a large drilling (Application and payment of fee is made through Sydney Water Tap in™).
Approval/s	(a) Water Main Drilling - Standard (DN 20 maintap): Approval for a Licensed Plumber (Driller) to carry out a standard connection to a water main by drilling into the main and installing Sydney Water approved DN 20 maintap (Application and payment of fee is made through Sydney Water Tap in™).
Water Main Connection – Standard (20 mm – 25 mm)	(b) Water Main Drilling – Large (DN 25 maintap): Approval for a Licensed Plumber (Driller) to carry out a connection to a water main by drilling into the main and installing Sydney Water approved DN 25 maintap following approval for a large water main connection (Application and payment of fee is made through Sydney Water Tap in™).
Bridging piece	Pipework and fittings provided in the form of a manifold on a water main, connecting from maintaps at two adjacent drilling locations to the end fitting of a large diameter water service.
Connection/s	In the context of this document, connection generally refers to the act of drilling a maintap (only) into Sydney Water main.
Driller	A Provider listed by Sydney Water to carry out water main connection (Drilling) activities.
Maintap	A tap installed in the main water supply line (Sydney Water's main)
Path Stop Tap	A stop valve installed below ground level in the Property Service, and with a Surface Box fixed in the ground with the lid level with the surface to give access to the underground valve.
Property service	Part of the water service, that is, the pipes and fittings for the supply of water to a property, from the water main up to and including the meter assembly, or to the defined meter location.
Tap in Building Plan Application Referral Letter	Documentation received by an applicant from Sydney Water following application and payment of fees (includes receipt). It details additional instructions for the applicant to follow.
Tuberculation	Partial closing, and therefore restriction, of a cut hole in the wall of a pipe due to build up of material on the cut surface, usually corrosion by-products (metallic pipes).
Water service	The cold water supply pipework from the water main up to and including the outlet valves at fixtures and appliances.

ABBREVIATIONS

ABBREVIATION	INTERPRETATION
AC	asbestos cement
AS/NZS	Australian/New Zealand Standard
CCN	Construction Commencement Notice
CICL	cast iron cement lined
CICLIS	cast iron cement lined in-situ
DICL	ductile iron cement lined
DN	nominal diameter (usually related to the nominal internal diameter)
km	kilometre
m	metre
mm	millimetre
OD or De	outside diameter or external diameter (often related to pipes sized to ISO standards)
PE	polyethylene
PVC	polyvinylchloride
PVC-M	polyvinylchloride modified
PVC-O	polyvinylchloride oriented
PVC-U	polyvinylchloride unplasticised
WSC	Water Servicing Coordinator

1 INTRODUCTION

This document sets out instructions and technical requirements for connection of water services by Drilling Providers engaged to install drillings into Sydney Water's water mains for either:

- 1.1 Developer work which must be facilitated by a Water Servicing Coordinator (WSC) under Sydney Water's e-Developer process; or
- 1.2 Non-developer work not requiring a Section 73 Certificate, which can be facilitated by application through Sydney Water Tap in™.

It complements documents listed in Section 3.

The document includes a mixture of mandatory and informative statements.

The information and guidance (informative text) has been deliberately interspersed throughout the mandatory requirements to provide some context and enable better understanding of the mandatory requirements. Informative text has been *italicised* to enable clearer differentiation.

Only Providers listed by Sydney Water as a Driller and with the appropriate capabilities shall perform work on Sydney Water's water mains.

Providers must carry out the work in accordance with Sydney Water's current "Instructions and Technical Requirements for Drillers". A current copy of this document must be available on site at all times.

If difficulties are encountered at any stage during the conduct of work, contact Sydney Water (Phone **13 20 90**).

Providers are responsible at all times for maintaining an accessible email address for the delivery of notices relevant to the Asset Creation Developer Process.

2 SCOPE OF WATER SERVICE CONNECTION (DRILLING)

The scope of works covered by a listed Water Service Connection Provider (Driller) is:

1. Provision of DN 20 and DN 25 connections (drilling), to PVC, DICL and CICL water mains up to DN 200, as approved at time of application, for DN 20 to DN 65 water services. Approval for water service sizes greater than DN 20 must be obtained prior to drilling application.
2. Construction and installation of "bridging pieces" (where required for the larger diameter water services).
3. Water Service Connections consisting of:
 - Excavation exposing Sydney Water's water main.
 - Installation of tapping band, maintap, and/or other approved product as appropriate, including under pressure drilling of a hole into the water main and insertion of an anti-tuberculation insert for DICL and CICL mains.
 - Restoration of polyethylene sleeving for DICL/CICL, and detection tracer tape for PVC.
 - Backfilling and compaction to Sydney Water Standards.
 - Restoration to Council and owner's requirements.

4. Water Service Disconnections consisting of:

- Excavation exposing Sydney Water's water main.
- Disconnection and sealing of an existing connection by the installation of a brass cap on the outlet of the main tap.
- Restoration of polyethylene sleeving for DICT/CICT, and detection tracer tape for PVC.
- Backfilling and compaction to Sydney Water Standards.
- Restoration to Council and owner's requirements

The scope of works for which a listed Water Service Connection Provider (Driller) **DOES NOT** include:

- Property Service or Water Service.

3 COMPLEMENTARY DOCUMENTS

The following documents complement these Requirements:

- Approved Products – Water
- Plumbing Code of Australia
- AS/NZS 3500.1 (Australian and New Zealand Standards)
- WSA 03-2011 Water Supply Code of Australia (Sydney Water edition 2012).

With the exception of the Water Supply Code, Australian Standard 3500 and NSW Code of Practice, these documents are available at www.sydneywater.com.au ➤ Plumbing, building & developing ➤ Developing ➤ Provider.

Further information related to work in public road reserves can be found in the Guide to Codes and Practices for Streets Opening, available on the NSW Streets Opening Conference website.

4 PLANNING

Plan the work adequately to address safety, minimise impact on the community and the environment and to ensure all materials, plant and equipment are appropriate for the task. Ensure leaks, wastage of water, or uncontrolled release of water will not occur during conduct of the work.

If the work involves extensive excavation, treat the trench environment as a confined space. Ensure compliance with Sydney Water Procedure *Confined Space Safety* (refer www.sydneywater.com.au ➤ Plumbing, building & developing ➤ Provider ➤ Instructions).

Verify that the size and type of water main is within the Scope of Water Service Connection (Drilling).

Note: *Sydney Water's records (e.g. Hydra) require field verification.*

Ensure ready availability of additional fittings, pipe and materials which may be required in the event of unforeseen circumstances and/or unexpected damage to the water main or maintap that may interfere with timely completion of the work.

For each job, follow Work Instruction "Investigate Site". If the site investigation identifies unexpected risks to safety, the environment and/or to compliance with process and/or technical requirements, take timely and appropriate preventive action.

5 PRODUCTS AND MATERIALS

Use only products and materials that are accepted by Sydney Water. Information on specifications for acceptable products can be accessed through Sydney Water's Website (www.sydneywater.com.au ➤ Plumbing, building & developing ➤ Developing ➤ Provider ➤ Standards & specifications).

6 EXCAVATION

This section specifies general requirements for excavation undertaken for Minor Works activities including drillings. Additional requirements for specific activities are specified in the Work Instructions and Drawings.

Dial Before You Dig

Determine the location and type of services in the area where work is to take place by contacting the "Dial Before You Dig" service (visit www.dialbeforeyoudig.com.au or telephone 1100) and by other appropriate means.

Take precautions against the possibility that major and/or dangerous services may be located within both public and private property.

Note: Dial Before You Dig does not usually provide information in respect of property services.

Ensure plans and information from utility services owners are available on site to assist in locating, identifying and protecting services both prior to and throughout excavation and restoration activities.

Immediately report damage to any services, whether public or private, to the owner of the service.

Work Site Assessment

Before commencing excavation, re-assess the site, including obstacles such as overhead power cables and traffic management requirements and verify that proposed environmental and safety precautions are adequate.

Do not commence work until conditions are confirmed as complying with relevant safe work requirements (including confined space).

Comply with recommendations and guidelines set out in the *Excavation work code of practice* published by WorkCover (available at www.workcover.nsw.gov.au).

Do not commence any excavation until all equipment and materials necessary to make the excavation safe are on site and available for use. *Equipment and materials includes all necessary fencing and barriers, as well as trench support systems.*

Size of Excavation for Drilling

Minimum size of excavation is to be 1 m x 1 m (a larger size excavation may be required to comply with minimum spacing of drillings Work Instruction 12.1, Table 1).

Support of Excavations

Comply with all support requirements set out in the *Excavation work code of practice*. For example:

- Support, or bench, any trench of depth greater than 1.5 m.

- Where material is stored within 1 m of the edge of a trench, the height of the trench shall be deemed to be the greater of:
 - (a) the distance between the trench floor and the top of the stored material or
 - (b) the height of the highest trench wall
- Support all trenches where trench walls are unstable. Deem all trenches 1.5 m and deeper to be unstable. In the event of uncertainty regarding any trench, obtain specialist engineering advice.
- For a trench of depth 1.5 m or greater, ensure plant, traffic and materials do not encroach within 1 m of the trench's zone of influence, except where support systems are designed for surcharge loads e.g. For an unsupported trench, no material or vehicular or plant loading shall occur within 3.5 m of the edge of a 2.5 m deep trench, or within 3 m of a 2 m deep trench, or within 2.5 m of a 1.5 m deep trench. If the trench is shored by support systems designed for the site, maintain between the edge of the trench and any load source the minimum distance specified in the *Excavation work code of practice*.
- Ensure that adjacent structures and services are not subject to disturbance by the trench support system.

Excavation Plant and Tools

Choose excavation plant and/or tools so that plant operation will minimise safety hazards, will not adversely impact on the environment and community and will not damage existing infrastructure.

Topsoil

During initial excavation, collect any turf sods and the topsoil and stockpile them separately from the bulk of excavated material.

Disposal of Excavated Material

Dispose of any excess material in accordance with the Council and property owner's requirements and with due regard to environmental legislation.

Excavation Under Roadways, Driveways and Similar Improved Surfaces

Obtain written permission from the relevant property owner(s) prior to commencing any excavation under or across improved surfaces.

If excavation is required across improved surfaces such as pavements, driveways, kerbs and gutters, or where the surfaces cannot be satisfactorily reinstated, assess constraints and, in consultation with Sydney Water, select an appropriate method (*e.g. boring*).

For open excavation across improved surfaces, keep the trench width to the minimum allowed. Saw cut neat straight lines through bitumen, asphalt and concrete at least 150 mm beyond the outer limits of the required excavation. Remove pavers, blocks and bricks by hand, clean them and set them aside for later replacement.

Excavation in Root Zones

Take every precaution to ensure that no undue damage is caused to tree root systems as a result of excavation. Consider excavating by hand or by boring to protect the root zone.

Where it is likely that pipes, fittings and joints may be damaged in future by interference from roots, root barriers of non-corroding material shall be installed.

Drillings

For install drilling refer to Work Instruction 12.2.

7 TRENCH FILLING AND COMPACTION

Placement and Compaction of Trench Fill

Before placing trench fill, ensure that pipe bedding fully supports the water main, water service and any fittings and that pipe embedment material covers the crown of the pipe by at least 150 mm (DI/CICL pipes) or 200 mm (PVC pipes).

Ensure that trench fill is free of large clumps and debris and complies with requirements specified in the Drawings.

When placing trench fill, avoid impact loading of the main, maintap and water service.

Place and compact trench fill in layers of approximately 300 mm.

Removal of Trench Supports

When removing, raising or withdrawing trench supports, prevent slips and falls and ensure that no damage, disturbance or displacement occurs to the pipe, fittings, geotextile filter fabric, pipe embedment and trench fill already installed. Ensure that all embedment and trench fill material located below such trench support and against native ground is progressively compacted as supports are withdrawn.

If agreed with the Council or property owner, the trench support system may be left in place as permanent support. Where the Council or property owner agrees to trench supports being left in place, cut off the support system at a depth at least 200 mm below the finished surface level required to satisfy structural and development requirements of the site.

8 SURFACE RESTORATION

Unless otherwise authorised in writing by the Council or owner of any disturbed property, replace or repair as near as practicable to the pre-construction condition all surfaces and/or improvements (*e.g. shrubs, gardens, retaining walls, fences, pavements*) which are disturbed or damaged during construction.

As soon as practicable after completing trench backfill, relay turf sods and topsoil previously removed and set aside.

Immediately after trench backfilling and compaction, make safe and temporarily restore trafficable areas to a condition suitable for withstanding traffic loads. Maintain the temporary restoration until final restoration is completed. Where pavements and driveways require restoration or replacement, complete such work in consultation with Council and the property owner and within one month of trench backfilling.

Restore bushland areas as near as practicable to their pre-construction state. Place previously stockpiled topsoil over the affected area and protect the site against erosion.

9 DISUSED WATER SERVICES

Where new developments or relocation of services results in an existing connection no longer being required, seal the redundant service at the point of connection to Sydney Water's system (maintap) by the installation of an approved cap (or approved fittings) on the outlet of the maintap. *The maintap shall be left closed. (Refer to Work Instruction 12.3).*

10 AUDIT OF DRILLINGS

Sydney Water's Asset Inspection Services team will select works to be audited.

The Asset Inspection Services team will audit works carried out **under Section 1.1 (developer works facilitated by a WSC)**. Prior to commencement of works the WSC, after consultation with the driller, must submit a CCN for Water Service Connections and Property Service Installations via SWConnect giving a minimum of two (2) full working days' notice.

For works carried out **under section 1.2 (facilitated through Sydney Water Tap in™)**, the Provider must forward a copy of the Construction Commencement Notice for Water Service Connections/ Drillings – Tap in™ applications to the following e-mail address: minorworks@sydneywater.com.au. NOTE: See the reverse side of this CCN for further information, conditions and warranties.

The Provider must carry out the works on the day and time nominated on the CCN. The works must be ready for audit at the time nominated on the CCN. If the auditor does not attend the site by the end of the nominated time frame then the provider may complete the works. The timetable also applies to notices for deferment and restart works.

For developer water main projects under section 1.1, the installation of the drilling and property service(s) will not occur until the water reticulation main has been chlorinated, tested and connected and all other authorities' services have been installed. In these cases, the Water Servicing Coordinator will issue a separate notification of commencement.

Additional instructions for section 1.2 works are on the Tap in™ Building Plan Application Referral Letter.

11 CORRECTIVE ACTIVE REQUEST (CAR)

Sydney Water or their representative to the Provider may issue a Corrective Action Request where a non-conformance is found or work is not performed in accordance with Sydney Water Standards and Instructions.

CAR's must be addressed promptly and within the timeframe noted on the CAR.

12 WORK INSTRUCTIONS AND DRAWINGS

The following Work Instructions and Drawings from the Water Supply Code of Australia (Sydney Water Edition) form part of the Requirements and shall be read in conjunction with the Requirements:

WORK INSTRUCTION TITLE	DRAWING NO	DRAWING TITLE
Investigate Site	WAT-1151-S	Design Layouts – Utility Services – Space Allocation in Footways
	WAT-1152-S	Design Layouts – Utility Services – Space Allocation in Footways
	WAT-1861-S	Marking Systems – Indicator Plates for Locating Hydrants
Install Drilling	WAT-1102-V	Typical Mains Construction – Reticulation Main Arrangements

WORK INSTRUCTION TITLE	DRAWING NO	DRAWING TITLE
	WAT-1106-V	Property Services – Single Service Main to Meter
	WAT-1108-V	Property Services – Connection to Main
	WAT-1852-S	Property Services – Connection to DICL Reticulation Mains
	WAT-1853-S	Property Services – Connection to PVC/GRP Reticulation Mains
	WAT-1201	Embedment & Trench Fill – Typical Arrangement
	WAT-1202	Standard Embedment – All Pipe Types
	FIG 1 (these instructions)	Typical Excavation at Water Main
	FIG 2	Typical drilling location at road crossing
	FIG 3 and 4	Location of Water Service and Meters Within Easements
	FIG 5	Maximum service offset within property

13 CHANGE HISTORY

Version number	Date revised	Approved by	Author/s	Brief description of change
5	13/9/2012	N Schaeper	J Perry	Section 2, Removal of advice prohibiting drilling of recycled water mains
6	25/03/13	N Schaeper	B Hansard	Update Sydney Water website links (only)
7	1 May 2013	N Schaeper	K Bain	Re-sequencing chlorination and pre-laid property service(s) requirements
8	17 April 2014	N Schaeper	J Perry	Under Introduction specify the documents required on site. References to Developer Works Inspection team changed to Asset Inspection Services team
9	9 November 2015	T Golland	B Hansard	Update for Sydney Water Tap in™ instead of Quick Check
10	12 April 2016	P Jansen	B Hansard	Update section 10 for SWConnect only
11	November 2016	I Williams	B Hansard	Update section 10 for Tap in CCN.

WORK INSTRUCTION 12.1

INVESTIGATE SITE

SCOPE

This Work Instruction sets out technical requirements for site investigation as a first step in undertaking any and all work. The purpose of the investigation is to:

- identify site safety and environmental issues
- identify water main pipe material and size
- assess whether the condition of the existing main is adequate to enable a watertight connection to be made and ensure that fittings and connections to be used are appropriate for the connection
- identify impediments to the work (e.g. other services)
- plan location of drilling (ensure correct position of drilling in relation to proposed water meter location, e.g. Figures 3, 4 and 5).

BACKGROUND

Special methods may be necessary for undertaking connections to water mains constructed from obsolete materials such as asbestos cement, or water mains of materials such as steel, polyethylene or copper. Connection of water services to these water mains types is not permitted within the scope of works for which a Water Service Connection Provider (Driller) is listed.

Sydney Water's database (Hydra) may not accurately record pipe material and/or details. Consequently, as a first step in undertaking work, a site investigation is required to determine the water main pipe material.

Drillers should be aware that, as a general rule:

- A relatively small number of water mains are constructed from alternative materials such as asbestos cement (AC), polyethylene or copper.
- Where mains are encountered that are not within the Scope of Works for which a Water Service Connection Provider (Driller) is listed, the driller must arrange for the drilling to be carried out by Sydney Water.

Water Mains that may be encountered include:

- *Cast Iron water mains that are either factory cement mortar lined or lined in-situ (in the 1950s). Cast Iron water mains may be lead jointed or rubber ring jointed.
- *Ductile Iron water mains laid since the mid 1970s.
- *PVC water mains ranging from uPVC (now labelled PVC-U) to modified and oriented PVC materials designated PVC-M and PVC-O.
- Steel water mains that are either concrete encased or laid with a coating of polyethylene.
- A remnant of less than 100 km of AC water mains.
- Older polyethylene water mains designated PE 50, medium density or high density.
- Currently used polyethylene water mains that are PE 80B or PE 100.
- Copper water mains, usually serving only one or two properties, and typically smaller than DN 100.

* Covered by the scope of this document.

PROCEDURE

Verify Records

Obtain services records (e.g. through Dial Before You Dig, Hydra plot from Sydney Water) and verify the accuracy of records in the field.

Site Safety and Environmental Issues

Assess site safety and environmental issues, develop appropriate documentation and execute requirements in accordance with relevant Provider Instructions (i.e. site specific Safe Work Plan and Environmental Management Plan).

If work involves deep excavation or is in a contaminated area treat the excavation as a confined space.

Ensure Materials Availability

Ensure ready availability of fittings and materials that may be required in the event of unforeseen circumstances and/or damage to the connection that may interfere with timely completion of the work.

Plan Drilling Location

Where possible all service connections shall be laid at right angles to the water main (and water meter). For more information on the correct location of drillings refer to Figure 4: Typical Water Service Arrangements Diagram. Where this is not possible the service may be offset within the property and a path stop tap installed at each change of direction with an appropriately marked path box at ground level (e.g. see Figures 2, 3 and 4). Large offsets (typically >1 m) are subject to approval by the NSW Fair Trading inspector.

Ensure correct location of drilling, and minimum clearances from collars, fittings, and other drilling/s is maintained.

Minimum Spacing of Drillings

The minimum spacing between drillings, and from any joint or fitting, shall be as per the following table:

TABLE 1

Pipe Type	Nominal Size DN	Minimum Spacing mm
PVC	100	500
PVC	150	500
PVC	200	500
DICL/CICL	100	500
DICL/CICL	150	500
DICL/CICL	200	500

Excavate to Reveal Water Main

Taking extreme care to avoid damage to the water main, excavate and expose a section of main at the proposed work location e.g. point of connection (refer to Section 6 Excavation).

Identify Water Main Material and Size

Clean and inspect the main to determine the pipe material and size.

If the pipe material or size are other than that specified on Hydra plot information, or if the pipe material or size is not included in the Scope of Water Service Connection (Drilling), do not proceed, notify Sydney Water (Phone: 13 20 90). (Sydney Water will review your Sydney Water Tap inTM application to see if we can carry out the drilling.)

If the pipe material and size is as per the *Scope of Water Service Connection (Drilling)*, proceed with work as appropriate and in accordance with relevant Work Instruction(s) and Drawings.

WORK INSTRUCTION 12.2

INSTALL DRILLING

Step 1: Approval and Application

Ensure required approvals have been granted and drilling applications have been made prior to commencement.

Drillings DN 25 or greater require approval from Sydney Water prior to making application for drilling. Follow any additional instructions on the Tap in Building Plan Application Referral Letter.

For developer water main projects the installation of the drilling and property service(s) will not occur until the water reticulation main has been chlorinated, tested and connected and all other authorities' services have been installed.

Step 2: Investigate Site

Execute Work Instruction 12.1 "Investigate Site".

Step 3: Install Drilling

Install a drilling in accordance with the relevant method (*selection of an allowable method depends on the water main material*).

Use an approved tapping band appropriate for the type of water main material.

Use an approved maintap.

Follow electrical safety procedures.

Ensure that correct location of drilling, and minimum clearances from collars, fittings, and other drilling/s is maintained (refer to Work Instruction 12.1, Investigate Site).

For PVC mains, use only an appropriate alloy steel fluted hole drill. **Twist drills must not be used on PVC mains.**

For CICL, CICLS or DICL use an appropriate hard faced masonry drill. Drill main using appropriate size metric/imperial drill to suit the size of maintap, and for metallic mains the anti-tuberculation insert.

Main tap shall be installed with spindle handle in the vertical position (i.e. on top of pipe).

Ensure drilling is not submerged (a leaking drilling or tapping band may be hidden). Use an appropriate method to minimise water wastage when flushing drilling.

Install a plastic insert to prevent tuberculation of the cut hole in a CICL, CICLS or DICL main (ensure diameter of plastic insert matches drill i.e. metric or imperial, refer to manufacturers specifications).

Metallic Mains - Execute Work Instruction 12.4 "Reinstate Sleeving".

Non-Metallic Mains - Execute Work Instruction 12.5 "Joining Detection Tracer Wire".

Ensure drilling is satisfactory and not leaking. **Immediately notify Sydney Water in the event of pipe failure, leaks, or other problems – 13 20 90**

Backfill excavation (refer to Clause 6 Excavation).

WORK INSTRUCTION 12.3

DISUSE WATER SERVICE

Where a water service or part of a service becomes disused, it shall be disconnected as required by the Authority at the owner's expense. Refer to our [Getting connected guide](#) for more information. The Licensed Plumber/Driller engaged to carry out water connections is responsible for ensuring existing services are disused in an approved manner on behalf of the owner/developer.

Step 1: Application

Ensure required application/s has been made prior to commencement.

For disuse of services an additional inspection and inspection fee is required (**Note:** inspection may be incorporated as part of other inspections on the property).

Step 2: Investigate Site

Execute Work Instruction 12.1 "Investigate Site".

Step 3: Disuse Connection

Arrange for inspection where required (**Note:** inspection may be incorporated as part of other inspections on the property).

Follow electrical safety procedures.

Ensure the redundant drilling/tapping band and maintap is not leaking and is in good condition. **(If drilling is leaking or in a poor condition, notify Sydney Water – 13 20 90.)**

Seal the outlet of the maintap with an approved cap (e.g. brass cap) or approved fittings.

Ensure valve is left in the off position (closed).

Return water meter.

Step 4: Backfill Excavation

Refer to Clause 6 Excavation.

WORK INSTRUCTION 12.4

REINSTATE SLEEVING - DICL/CICL MAINS

Where the main was provided with a polyethylene protective sleeving, this should be fully reinstated to Sydney Water Standards. Sleeving is required to be installed on **all** drillings done on CICL and DICL pipes.

The sleeving acts as a physical barrier preventing pipeline-soil contact. Older mains with sleeving will be Green in colour; new standard is for Blue sleeving.

All damage to sleeving must be repaired. Reference – Drawing WAT-1852-S.

Step 1: Drillings on Mains with Existing Sleeving

Must be fully repaired and sealed using adhesive tape (eg duct tape). Replaced sections must overlap the existing sleeving and be fully sealed. Folds in the sleeving are to be located at top of pipe.

Step 2: Drillings on Mains with No Existing Sleeving (e.g. older CICL mains)

Must have sleeving installed with a minimum of 300 mm either side of centre of drilling and be fully taped to the main.

WORK INSTRUCTION 12.5

JOINING DETECTION TRACER WIRE – NON METALLIC MAINS

Tracer tape is provided for location and tracing of non-metallic mains. Care should be taken during excavation to avoid damage to the tracer wire/tape (where a tracer wire has been installed at the time of laying).

Step 1: Repair Damaged/Broken Tracer Tape

Ensure broken wire is repaired in an approved manner to maintain electrical conductivity. Use connectors (eg automotive type electrical connectors or similar).

Step 2: Tracer Tape Location

Metal tracer tape must be laid along the main on top of the pipe embedment material. Ensure tape is not broken or moved during backfill operations.

WORK INSTRUCTION 12.6

MAINTAIN EQUIPMENT

Ensure drilling equipment/tools are appropriately maintained.

Prevent contamination of equipment and fittings and ensure a high standard of hygiene with respect to all materials and equipment used in drillings.

For PVC mains, the core drill (fluted hole drill) must be kept sharp or replaced regularly. *Blunt cutters will lead to cracking/fragmenting of holes and may cause "plug" to be torn off the inside of the main and prevent removal, and allow the plug to be left inside the water main.*

Maintain drill bits in a sharp condition.

WORK INSTRUCTION 12.7

PERMISSIBLE MATERIALS FOR MAIN TO METER WATER SERVICES

The property service, that is the section of water service from the water main to meter, shall be laid using approved pipe materials as follows (for sizes DN 20 to DN 65):

- **Copper** for services DN 20 to DN 65
- **Polyethylene** for services DN 20 to DN 65
- The remainder of the water service (within the property) may be laid using these materials or any of the other “fit for purpose” materials in AS/NZS 3500.1 (Australian and New Zealand Standards) and in accordance with the Plumbing Code of Australia.

FIGURE 1

Typical Minimum Excavation for Drilling

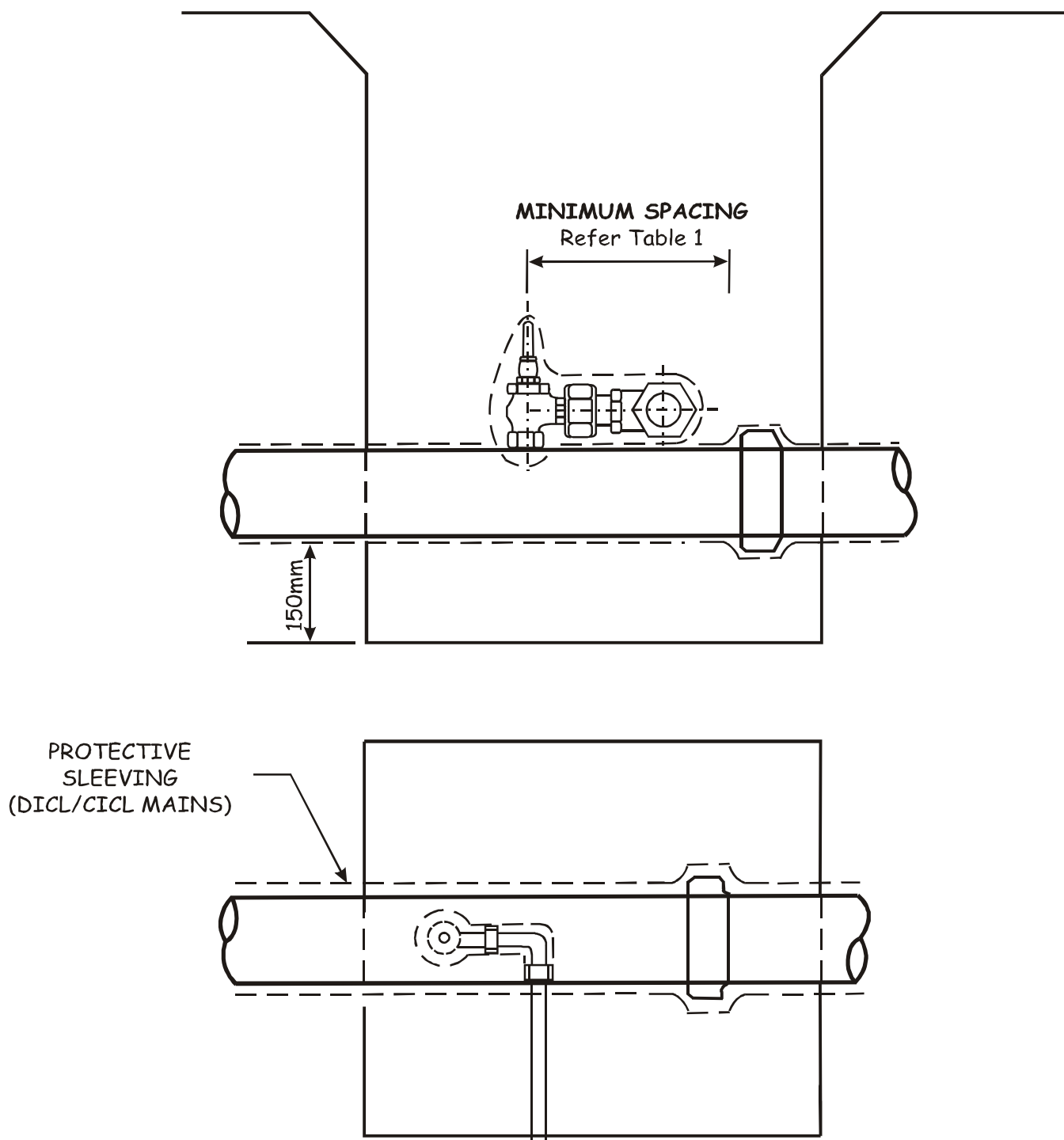
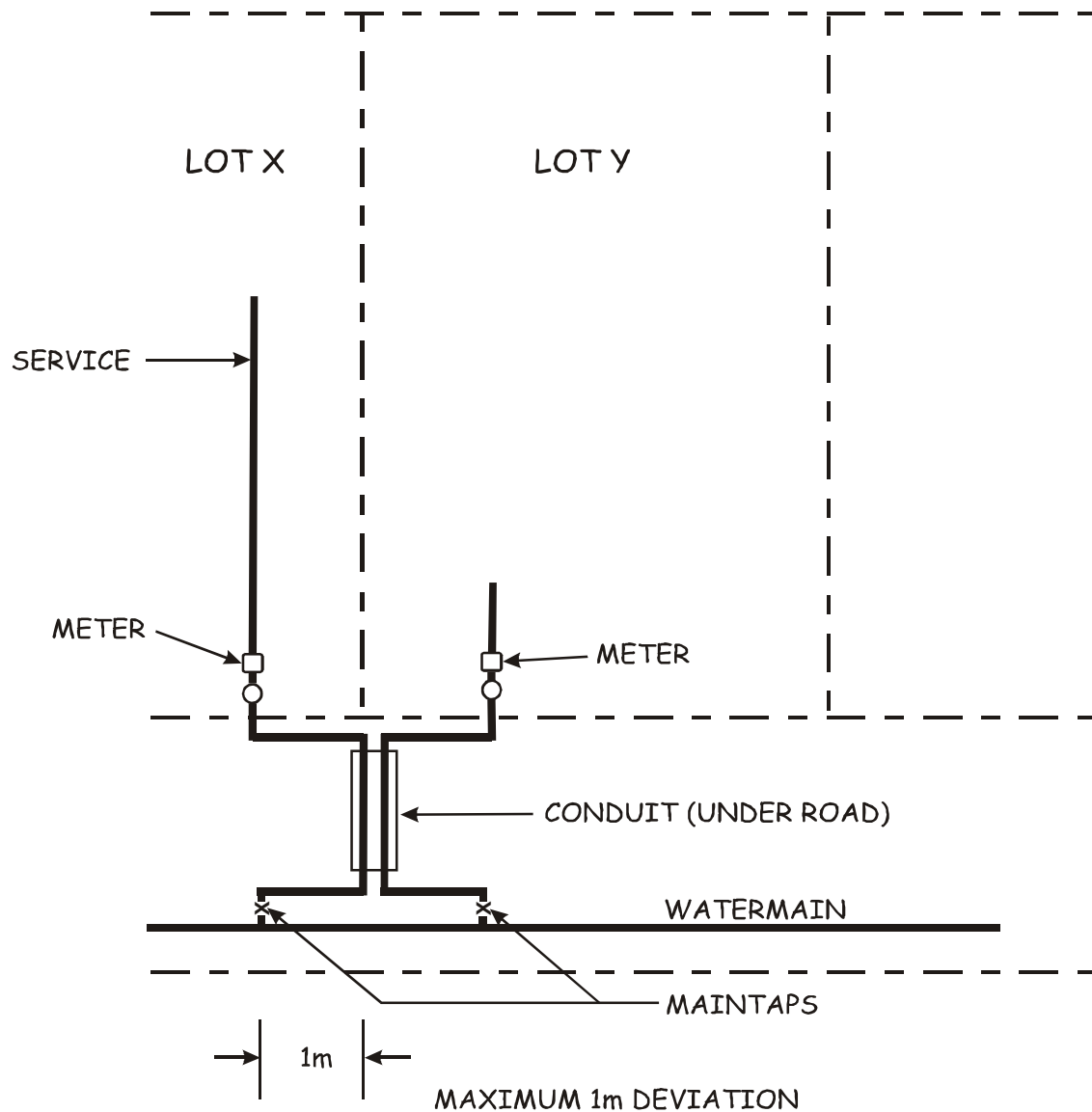


FIGURE 2

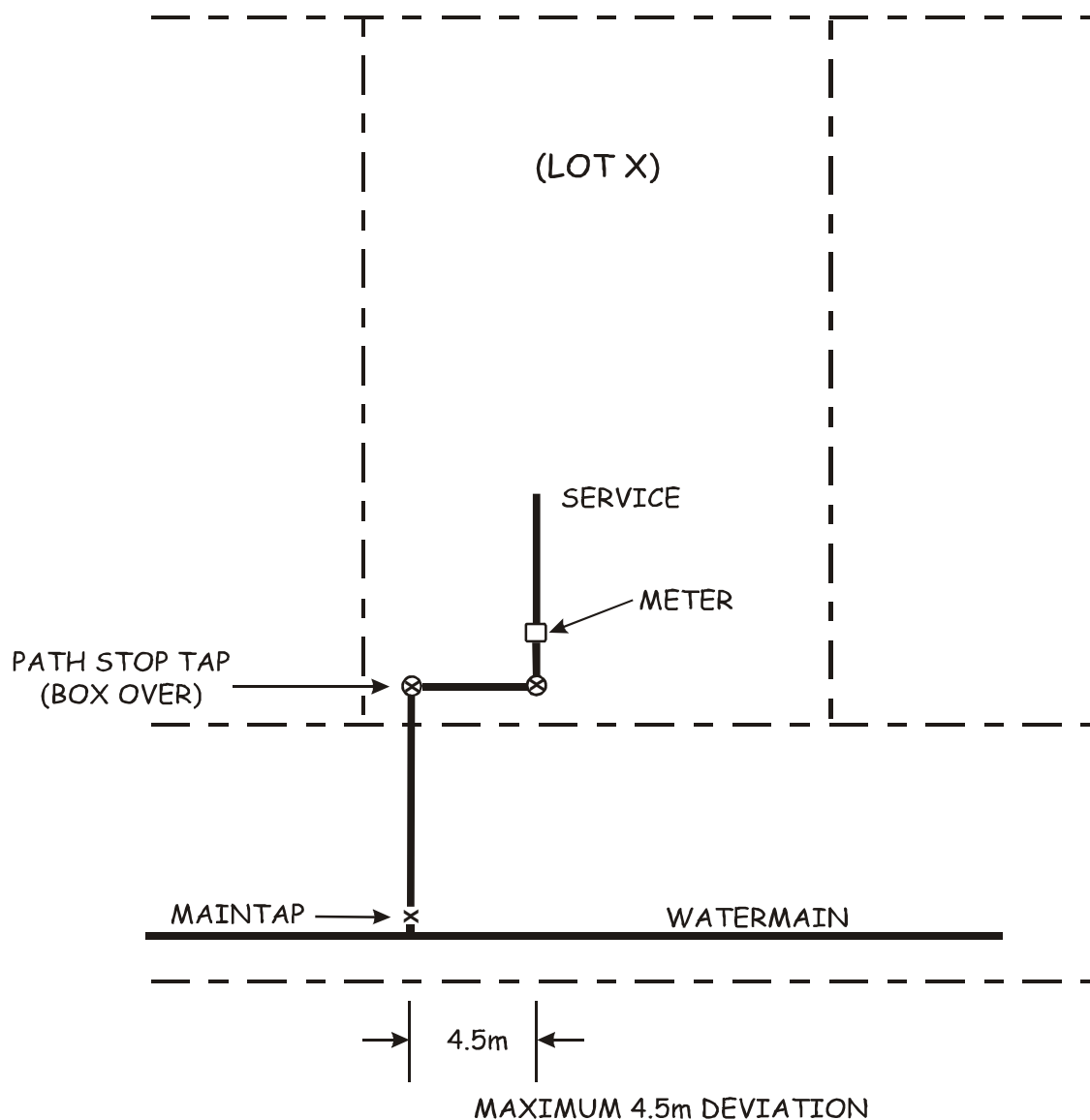
Typical Drilling Location at Road Crossing

**Notes:**

1. Metering arrangement must be in accordance with Sydney Water's requirements. To find out more, read our [Water meter installation guide](#).
2. All drillings are to be positioned directly opposite the water meter and at right angles to the water main.
3. Polyethylene property service(s) installed under roadways/footpaths shall be continuous and free of any joints between the water main ball valve and property connection ball valve or meter riser connection fitting or Tee for twin property services.

FIGURE 3

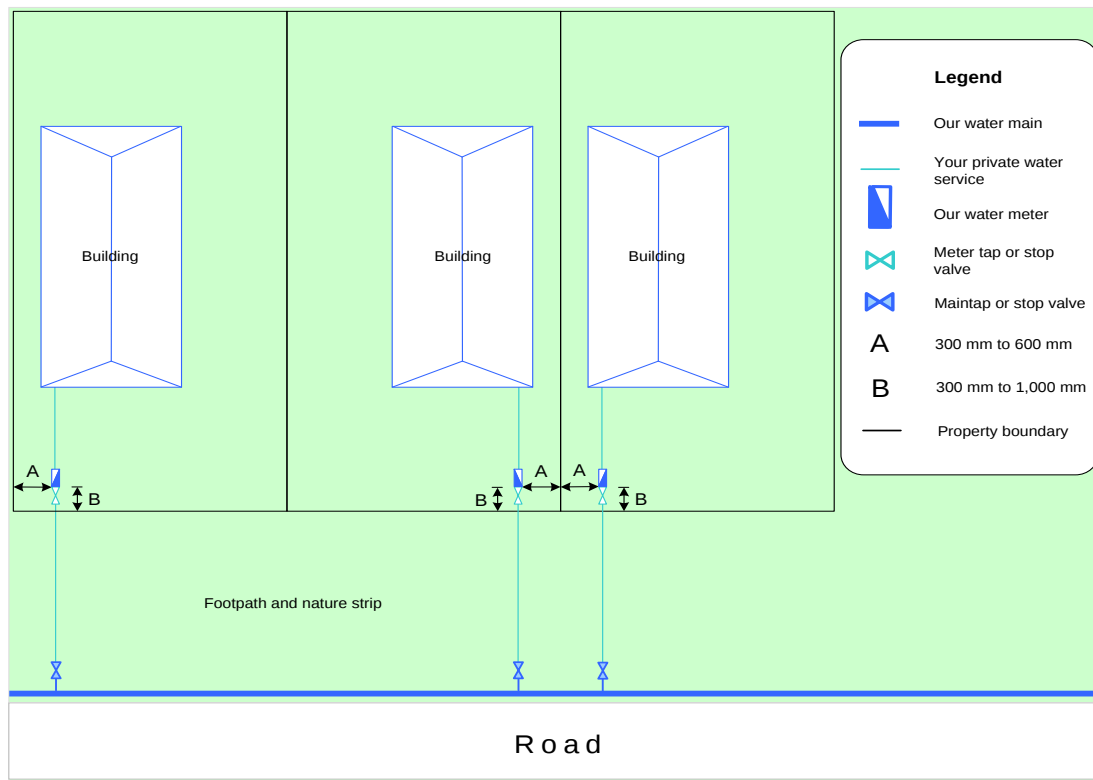
Maximum Service Offsets Within Property Boundary

**Notes:**

1. Sketch shows maximum allowable deviation of drilling from meter location without prior written approval.
2. Offset must be within the boundary of the subject property.
3. For use where positioning of drilling directly opposite the water meter and at right angles to the water main is not possible due to obstructions (e.g. driveway, hydrants and stop valves etc.).
4. Meter location must comply with Sydney Water's requirements. To find out more, read our [Water meter installation guide](#).

FIGURE 4:

Typical water service arrangements diagram

**Notes:**

1. Install most meters:

- between 300 mm and 1,000 mm inside the front property boundary
- between 300 mm and 600 mm from the left or right property boundary
- parallel to the closest side boundary
- 300 mm from the ground.

To find out more, read our [Water meter installation guide](#).

2. Only a licensed plumber can install any meter we issue onto a private water service. This is except for a 20 mm meter going onto a locked and tagged water service. Sydney Water installs those meters.